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ABSTRACT

These five papers are from a symposium facilitated by Ronald L. Jacobs on financial analysis of human resource development (HRD) at the 1995 Academy of Human Resource Development conference. "Return on Investment--Beyond the Four Levels!" (Jack J. Phillips) offers a modification of the Kirkpatrick model of evaluation for HRD in cost-benefit analysis. "Interpreting a Compact Cost/Benefit Analysis that Assesses the Performance Value of Training" (Paul E. Brauchle) examines a procedure that can be used to calculate the performance value of training in dollars in order to provide evidence that it actually improves performance and the "bottom line." "Free to Choose: Returns on Investment in Education in the Netherlands" (Joop G. Odink, Ruurd Kunnen) discusses the Dutch educational system and the personal and societal monetary rates of return for various educational paths. "The Impact of Values on the Financial Analysis of HRD" (Jennifer Gail Parsons) investigates the benefits and problems inherent in using HRD financial analysis tools and emphasizes the impact that values have on the results of analysis. "The Economic Returns of Education and Training from a Labour Market Point of View" (Ruurd Kunnen, Joop G. Odink) asks how the economic returns of education could be improved from a labor market point of view. (KC)

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# ACADEMY OF HUMAN RESOURCE DEVELOPMENT

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## St. Louis, MO

[17] **FINANCIAL ANALYSIS OF HRD** Facilitator: Ronald L. Jacobs, Ohio State University

**Return on Investment-- Beyond the Four Levels!**
Jack J. Phillips, Middle Tennessee State University

**Interpreting A Compact Cost-Benefit Analysis that Assesses the Performance Value of Training**
Paul E. Brauchle, Illinois State University

**Economic Returns of Education and Allocation of Labor**
Joop G. Odink, University of Amsterdam (The Netherlands)
Ruurd Kunnen, Organization for Strategic Labor Market Research (The Netherlands)

**The Impact of Values on the Financial Analysis of HRD**
Jennifer Gail Parsons, Oklahoma State University

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# Return on Investment -- Beyond the Four Levels!

*Jack Phillips*
*Middle Tennessee State University*

*The Kirkpatrick model of four levels of evaluation has served the HRD profession for over 35 years. While it has been accepted by practitioners all around the globe, it has also been criticized and alternative models have been offered. With today's need for HRD accountability and the growing importance of showing cost vs. benefits, the Kirkpatrick model appears to be limited. A modification to this model, a five level framework, offers a more appropriate and acceptable framework for HRD evaluation.*

The HRD profession and the climate in which the profession is practiced has changed significantly in the 35 years since Kirkpatrick developed his four levels for evaluating training programs (Kirkpatrick, 1959a; 1959b; 1960a; 1960b). At the time of its development, the framework provided an ingenious way to sort through the maze of evaluation problems facing training practitioners at that time. There was a void of useful models to help the practitioners tackle this important issue. The four level framework was well received and has since been the model of choice for the practitioners (Kaufman and Keller, 1994). It has enjoyed widespread use and has a reputation throughout the world as a logical, practical, and useful framework to pursue evaluation (Bramley and Kitson, 1994). With the growth of HRD and the growing importance of the function, adjustments that are necessary in the model to make it more useful and practical for today's practitioners while at the same time addressing some of the concerns about the approach.

## The Basic Model

***The Four Levels.*** In 1959 Kirkpatrick proposed four levels of evaluation for training, as shown in Figure 1.

**Figure 1. Kirkpatrick's Four Levels of Evaluation with Original Definitions.**

| | Level | Question |
|---|---|---|
| 1. | Reaction | How well do the trainees like the program? |
| 2. | Learning | What principles, facts and techniques did the conferees understand and absorb? |
| 3. | Behavior | Did the trainees change their on-the-job behavior? |
| 4. | Results | What results were obtained? |

Kirkpatrick's original model was narrowly focused, deviating very little from the literal definition of the above steps. Although the basic model has not been modified in later presentations, Kirkpatrick began to broaden some of the concepts and definitions in later years (Kirkpatrick, 1994). Perhaps this was a result of criticisms of the model from both the practitioners and researchers.

***Research on the Levels.*** There has been a tremendous amount of research undertaken to test Kirkpatrick's model and to examine relationships within the four levels. Alliger and Janak (1989) identified three problematic assumptions about the Kirkpatrick model: (1) The levels are arranged in ascending order of information provided. (2) The levels are causally linked. (3) The levels are positively intercorrelated. Their study examined the validity of these assumptions, the frequency of each level in published evaluation studies, correlations from the literature in regard

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to Assumptions 2 and 3, and implications for the researcher and training manager. Collectively they examined over 200 studies and found little support for the assumptions. Kaufman and Keller (1994) compared the Kirkpatrick framework to five levels of critical organizational concern and evaluation and offered an adjusted model.

***Acceptance of the Model.*** Acceptance of the model has been widescale, particularly with practitioners. The model provided a useful, understandable, and practical way in which practitioners could evaluate their programs. The extent to which practitioners have utilized the concept is impressive (Moseley and Larson, 1994; Veech, 1994; Krein and Weldon, 1994). The four level model provides a reference for many current studies about evaluation. For example, the latest Industry Report from Training Magazine provided data on the extent to which companies use the four levels in their evaluation plans (Who's Learning What?, 1994). This report, shown in part in Table 1, reveals the widespread adoption of the four levels and the significant use at each level.

**Table 1. Status of Training Evaluation - All Industries.**

| | Percent Measuring At | Percent of Courses |
|---|---|---|
| Level 1 | 83 | 79 |
| Level 2 | 66 | 45 |
| Level 3 | 62 | 45 |
| Level 4 | 47 | 44 |

Another major effort involving a search for best practices, the American Society for Training and Development launched a benchmarking forum in 1992 (Kimmerling, 1993). Measurement and evaluation is one of the four key areas of initial investigation with this group. The participants in the forum present data by level of evaluation using Kirkpatrick's model.

The four level system has become a standard reference for articles and reports on evaluation (Shelton and Alliger, 1993; Altizer, 1994; Veech, 1994). In workshops outside the U.S., I can count on at least half of the participants to have some familiarity with the Kirkpatrick four level scheme. It has become the most widespread and commonly used model among practitioners.

## Problems with the Kirkpatrick Model

Although the model has endured widespread use among practitioners, it is the subject of review and critique among researchers (Fitz-enz, 1994; Kaufman and Keller, 1994; Alliger and Janak, 1989). More recently, practitioners have questioned the limitations of the model (Marshall and Schriver, 1994; Bushnell, 1990). The concerns involve four major areas.

***Linkages Between Levels.*** The model is based on assumptions that there was a linkage between the different levels. (i.e., when a participant enjoyed the program, learning would occur; when there was learning, there would be on-the-job behavior change; when there was behavior change, there would be results.) Unfortunately, these linkages do not exist or are not very strong (Alliger and Janak, 1989). There is considerable evidence that suggests that positive reactions at the end of a program do not necessarily correlate with learning (Dixon, 1990). Also, many research studies on transfer of training have shown that while participants may learn the material, there are many legitimate reasons why it does not appear as behavior changes on-the-job (Broad and Newstrom, 1992).

***Definitions.*** Kirkpatrick's model was limited in its definition of levels one, two, and three. In the basic model, level one focuses on how well the trainees "linked a particular training program," a very narrow view (Kirkpatrick, 1959a). There are other important elements that could be included at this level including resources, efficiency and planned actions. At level two, Kirkpatrick defined learning as "principles, facts, and techniques...understood and absorbed by the conferees" (Kirkpatrick, 1959b). This is rather limited and should be expanded to include

knowledge, skills, and attitudes. At level three, the term behavior change is limiting. Although most training brings about a change in behavior, there are other times when training causes the acquisition of knowledge or changes in attitudes which may not appear as observable behavioral change. Because of this, the definition of behavior needs to be broadened to indicate any on-the-job applications of the training or learning material to produce needed changes.

***Accountability.*** Originally Kirkpatrick's level four focused on results. He stated that training should cause measurable changes in improved productivity or quality, reduced absenteeism and turnover, or a variety of results at the work unit, department, division, or organizational level (Kirkpatrick, 1960b). The initial focus of the level four evaluation was on monitoring these output variables to observe changes after the training program was conducted. (i.e., productivity increased by 10% six months after the training program was conducted or absenteeism was reduced by 15% three months after the program.)

In terms of the value of the data collected, this approach has two limitations. First, the results were not converted to dollar values. There is a need to understand and account for the value of an improvement (Fitz-enz, 1994). For example, top management may want or need to know the value of a 15% reduction in absenteeism. This requires organizations to place values on all types of training program results. Thus, a value added component is needed.

The second limitation is the absence of training costs. For a complete evaluation the cost of the program must be compared with the actual value derived (Marrelli, 1993a). In too many cases, the results of a training program, although moving in the right direction, did not add enough value to cover its costs (Altizer, 1994; Rust, Zahorik, and Keiningham, 1994). As a result, many programs evaluated at level four escaped the true accountability of comparing the net benefits of the program with all of the costs of the program. In later versions of Kirkpatrick's model, the concept of cost/benefit analysis was discussed as "one way to measure the results" (Kirkpatrick, 1983). This confuses practitioners since a cost/benefit analysis is a different level of evaluation when compared to tracking results such as productivity and quality improvements. Most practitioners have omitted the cost component with the assumption that they are tracking level four performance data.

***Isolating the Effects of Training.*** Earlier versions of Kirkpatrick's model paid little attention to the various ways of isolating the effects of training, which is an important part of level three and four evaluations. In almost every training program where improvement is documented with on-the-job behavior change or results, there were other influences or factors which contributed to those results (Davidove, 1993). Few cases exist where training is the only input variable which has an influence on an output variable during the timeframe of a training program. Therefore, an important and essential ingredient of any evaluation effort must be a deliberate attempt to isolate the effects of training.

In the initial presentation of the model, Kirkpatrick stated that for an evaluation at level three, a control group was needed to determine the amount of behavior change (Kirkpatrick, 1960a). Yet, some of the studies used to illustrate the point did not use a control group. In reality, there are many ways to isolate the effect of training (Davidove, 1993). One recent report identified ten strategies to isolate the effects of training (Phillips, 1995). This issue must be addressed at level four as well as level three although it is probably assumed that controlling at level three will address the issue at level four. Without proper attention to this issue at both level three and four, training will improperly take credit for any improvement and the evaluation will lose considerable credibility.

## Return on Investment - The Trend Continues

In any direction one chooses to take in the HRD field, the pressure to measure the return on investment (ROI) is increasing. In developing countries as in fully developed nations, the issue is a hot topic among HRD professionals. At some time or another, virtually every organization will face this important issue. The pressure to measure the results from training may come from line managers, the internal customers of HRD who must support HRD, or from top executives who

must allocate resources to those functions in the organization that are contributing to the bottom line (McIntosh, Page and Hall, 1993). Seven important trends, summarized below, are visible on the HRD horizon which collectively provide important evidence of the pressure for increased use of ROI.

***Training and Development Budgets Are Increasing.*** There is clear evidence of the increase in training and development budgets. In the United States, budgets for 1993 were up 7 percent over 1992, and the number of individuals trained increased 15 percent, one of the largest increases in recent history (Industry Report, 1993). In 1994, the trend continued with a 5 percent increase to $50.6 billion (Industry Report, 1994). Budgets are also increasing in other countries, particularly where training expenditures are tied to government legislation..

As budgets increase, so does the need for accountability. It is important for business to evaluate HRD programs as other large investments are evaluated - in terms of the costs and benefits (Mosier, 1990). Also, large (and growing) budgets become big targets for critics. When HRD receives significant funding increases, it is usually at the expense of other parts of the organization not receiving similar increases. When this continues, the HRD budget will be a target of people who question its existence or its ability to enhance organizational effectiveness. This situation creates pressure on the HRD staff to show that the function is achieving results in the language that top management understands, ROI.

***HRD is Linked to Competitive Strategies.*** Many organizations are utilizing HRD as a competitive weapon to create a distinct strategic advantage. In some situations, training is seen as the most critical competitive weapon (Sloman, 1994). Whether the organization is experiencing tremendous growth, restructuring, right-sizing, or changing markets and locations, training is seen as an important vehicle to implement these changes. HRD has become a powerful change management tool to help organizations successfully meet the challenges of the future. Ambitious HRD efforts, linked with competitive strategies enable organizations to increase market share, introduce new products, improve delivery and customer service, reduce cost, become more efficient, improve response times, and increase productivity (Pulley, 1994). When training takes on a highly visible role, such as implementing parts of the strategic plan, there is more pressure for accountability. Top executives and other significant groups want to ensure that all competitive tools are accountable and measurable.

***ROI Failure in Organizational Change Efforts.*** Many organizational change efforts which have significant HRD efforts as part of the process have failed because the results did not offset the costs. While some of these programs, such as Total Quality Management (TQM), have produced results, they do not pass the ROI test when values are placed on the added benefits of the program, and compared to the costs for the program (Rust, Zahorik and Keiningham, 1994). As a result, many current organizational change programs, including reengineering and restructuring, have become questionable because of the lack of ROI accountability built into the process (McElrath-Slade, 1994). Consequently, top management in many organizations are beginning to demand a forecast of ROI before pursuing those programs (Thornburg, 1992).

***Accountability of All Functions Is Increasing.*** Virtually every function in an organization is being subjected to increased demands for accountability. Functions previously taken for granted as necessary and unmeasurable (e.g., public relations) are now required to show a contribution. This is particularly true for staff support functions. Even internal auditors, who several years ago never dreamed of being held accountable for their success, are now adapting measurement processes and in some cases turning audit functions into profit centers. In this respect, HRD is just one of many functions responding to pressures to show their contribution in measurable terms, such as ROI.

***Top Executives Require ROI Information.*** Chief executives, struggling to make their organizations lean, profitable, and viable, are demanding accountability with all expenditures. They are encouraging, and sometimes requiring, the HRD staff to measure ROI (McCune, 1994). In some cases, executives issue ultimatums to show the value of HRD or take a budget cut, as it occurred at IBM (Gallagan, 1989). In other cases, top executives use subtle hints and suggestions. In an editorial, one of the largest associations for top managers recently recommended that

Level five evaluation requires the addition of two important and necessary steps. The first step is the conversion of the results tabulated in level four to a monetary value to be used in an ROI formula. This requires a direct conversion of hard data such as quantity, quality, cost, or time which can be relatively easy for some programs such as technical training (Reynolds, 1993). For soft data, the task is more difficult, although a variety of techniques are utilized to place values on the improvements. Table 2 shows a range of approaches.

**Table 2. Techniques for converting soft data to monetary values.**

- Participant Estimation
- Supervisor Estimation
- Management Estimation
- HRD Staff Estimation.
- Historical Costs
- Expert Opinion
- External Studies

Estimating values can be a reliable and accurate method for placing values on training data (Marrelli, 1993b). Even soft, interpersonal skills training can be evaluated in dollar-and-cents terms (Fitz-enz, 1994).

The second step involves the calculation of the costs for the program. Although there has always been a need to capture training costs, the need is greater with the pressure for ROI. Unfortunately costs are not clearly defined or pursued in many organizations. The addition of this step will focus more attention on accountability and require organizations to develop costs as they move to the fifth level, the ultimate level of evaluation.

With this process, HRD professionals must develop an evaluation strategy and make a deliberate attempt to move through the chain of evaluation levels up to and including the fifth level. In some cases, the evaluation may stop at level one or two. In others, evaluation may be conducted at level three with no evaluation at level four. Still, in other cases, a level four evaluation may be developed without a level five evaluation. And, finally, level five would show the ultimate evaluation. The movement up the chain depends on the type of program, management's interest in higher level evaluation, and the resources available for evaluation. Some organizations develop targets for each level (Phillips, 1994).

This model has several minor adjustments from Kirkpatrick's model which increase its likelihood of success. Reaction at level one in Kirkpatrick's model is changed to reaction and planned action. Because training transfer is such an important issue, it is helpful to include efforts to enhance the possibility of transfer. Requiring participants to outline how they plan to use what they have learned assists in the transfer of training (Broad and Newstrom, 1992). In addition, information on planned actions can provide insightful information on how participants have internalized the material and plan to utilize it. Also, if a follow-up is scheduled, the planned actions serve as a basis from which to compare progress. At level two, the definition of learning is broadened to specifically include knowledge, skills, and attitude. At level three, another adjustment is made in the use of on-the-job applications instead on behavior change. This implies that participants may have changes in knowledge, skills, and attitudes which could be applied in any combination to improve the situation at the work place. It is not strictly confined to behavioral changes. Finally, level four is changed to business results to reflect the need to present results in a form that top management expect and understand.

In workshops where this model has been presented, the reaction with practitioners has been overwhelming. In a sample of 285 practitioners in the U.S.A. and Canada, 98 percent preferred this modified model to the four level model of Kirkpatrick. The other two percent had no opinion. Some workshop participants indicated that the introduction, explanation, and application of this new model was one of the most important parts of the seminar on calculating the return on investment in training. In addition to the United States and Canada, this model has been introduced in Mexico, Venzuela, Australia, Indonesia, Malaysia, and Singapore. The reaction in all cultures parallel those of the U.S. and Canada, an overwhelming acceptance of the modified approach.

executives require a calculation of the return on investment in training and development (Fagiano, 1994).

***Global Interest in ROI.*** All around the globe there appears to be significant emphasis on ROI as an important topic for HRD practitioners (McCune, 1994). A recent study of 35 organizations, all members of the International Federation of Training and Development Organizations, showed that among the topics of interest to the members, ROI ranked at the top. Interest in ROI appears to be motivated by different purposes. In mature economies such as the United States and Europe, ROI is pursued to see if HRD funding levels should continue or be increased. In developing nations, such as Malaysia and Indonesia, the ROI is being utilized to determine which types of training programs provide the most return for the organization. In those countries, there is little interest in reducing the funding levels, as there might be in other countries.

***Practitioners' Interest in ROI.*** In all types of organizations, practitioners are beginning to develop a sense of accountability for their programs. In an attempt to become a business partner and contribute to the organizational goals, practitioners are seeking techniques and methods to show the worth and contribution of their programs, and the ROI appears to hold the most promise for this goal (Swanson, 1993). Financial analysis can be a valuable tool for HRD managers who must justify investments in various programs. The same applications used to justify investment in capital, land, or other resources can be used to justify training and development on the basis of improved productivity and profitability (Mosier, 1990, p. 49).

Results from practitioners are impressive. Kraft General Foods reports an average of $6,000 value added per student per course (Noonan, 1993). Motorola reported a $33 return for every dollar spent for quality and process training in selected plants (Wiggenhorn, 1990). Magnavox netted 741% ROI in a literacy training program while Yellow Freight Systems claims 1,115% ROI on a HRD program in performance management (Phillips, 1994, p. 102 and 266). Skill Dynamics, an IBM subsidiary, reported a 259% ROI in a training program for service representatives (Shelton and Alliger, 1993).

Recently, the American Society for Training and Development, clearly the world's largest organization for HRD practitioners, initiated a new case study series, **In Action**, designed to present real world applications of significant issues in HRD. Although approximately 30 titles are planned, the first title focused on **Measuring Return on Investment** (Phillips, 1994). This was considered one of the most important issues facing practitioners today. The response was so positive that a Volume II of the title is planned.

## A New Model

The limitations of the Kirkpatrick model, and the concern for more attention to ROI, has led to the development of a modified version of Kirkpatrick's model, depicted in Figure 2.

**Figure 2. Five Levels of Evaluation.**

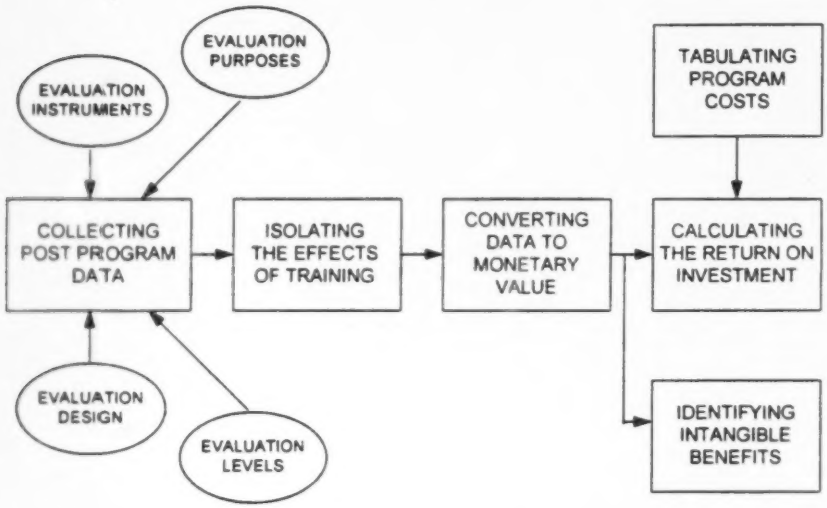
| | Level | Question |
|---|---|---|
| 1. | Reaction & Planned Action | What are participants' reaction to the program and what do they plan to do with the material? |
| 2. | Learning | What skills, knowledge, or attitudes have changed and by how much? |
| 3. | Job Applications | Did participants apply on-the-job what they learned? |
| 4. | Business Results | Did the on-the-job application produce measurable results? |
| 5. | Return on Investment | Did the monetary value of the results exceed the cost for the program? |

The primary modification is the addition of the fifth level, which focuses on the return on investment. The other four levels are very similar to Kirkpatrick's with some minor changes.

**The ROI Analysis**

Any framework for evaluation must include a complete description of the process within which the evaluation data is fully developed and analyzed. For example, the issue of isolating the effects of training must be addressed as the model is implemented in practice. When level five evaluation is pursued, the ROI process, shown in Figure 3, is recommended.

**Figure 3. ROI Model.**




The evaluation levels are combined with other important evaluation elements such as purposes, instruments, and designs, to include an overall data collection scheme. After the data is collected, the ROI analysis begins with deliberate attempts to isolate the effects of training on the data items. As shown in Table 3, at least ten strategies have been utilized:

**Table 3. Methods to isolate the effects of training.**

- Use of Control Groups
- Trend Line Analysis (Time Series)
- Forecasting Methods
- Participant Estimation of Training Impact
- Supervisor Estimates of the Impact of Training
- Management's Estimate of Training's Impact
- Customer Input
- Expert Estimation of training Impact
- Subordinate Input on Training's Impact
- Calculating/Estimating the Impact of Other Factors

The next step is the conversion of the data to monetary values, a process briefly described earlier. Costs are developed and are compared to the monetary value of the benefits to develop the ROI calculation. The ROI formula becomes net program benefits divided by program costs where the net benefits is the monetary value of the benefits minus the costs of the program. This model also recognizes the fact that there should be intangible benefits that will be presented along with the ROI calculation.

## Conclusion

In conclusion, Kirkpatrick's model has served the HRD field admirably for over 35 years. With the pressure on HRD professionals today, it is time to make some modifications of the model. Rather than develop a completely new model, as some have suggested, it is best to build on one which has achieved widespread acceptance and adoption. This new approach, a five level model with an ROI process, updates and enhances the Kirkpatrick model. This new approach has been received very well in early introductions, particularly when it is presented in the context of a model in which the ROI calculations are developed.

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# Interpreting a Compact Cost/Benefit Analysis that Assesses the Performance Value of Training

*Paul E. Brauchle*
*Illinois State University*

*Evidence that training actually enhances productivity of workers and improves the "bottom line" of businesses is often hard to obtain. A need exists for a method of showing training effectiveness that is not very time consuming and detailed, yet delivers compelling results in terms that managers understand. This paper examines the procedure suggested by Godkewitsch, and recommended by ASTD, for its practical significance. The results clarified a method that uses norm-reference information to calculate the performance value in dollars, and at the same time is conceptually reasonable and easy to apply to many situations whose norm-reference information is available.*

Trainers are often plagued by demands that they produce evidence to support the productivity of the training enterprise. Sometimes this evidence must come from an analysis of the effectiveness of training. What we need is a method of demonstrating the justification of training that provides documentary evidence of effectiveness and delivers results in terms that managers know and understand. Probably the best way to do this is to use dollar value for the training activities that have been conducted. Managers may understand a dollar-based accounting for the value of training and may be convinced that training initiatives are worth the investment of additional dollars. Techniques for doing this are most often known as cost/benefit analysis, and they are often thought to be overly lengthy, detailed, and ponderous. However, simpler methods do exist for calculating the dollar value of training. One method (Brauchle, 1992) partitions each job into significant tasks and assigns values for the task's difficulty, importance, and frequency. The individual's performance on the task is determined and performance values are calculated before and after training. Performance gain is then determined for each task and for the job as a whole.

While this method is easier than most, the trainer may need to show training effectiveness with equal precision but with less detail. Thus, the need for a more "compact" method. This paper will describe a simple technique that considers larger components of jobs and uses fewer variables, but provides similar data. Because it is shorter and more direct, it may be called a "compact" cost/benefit analysis.

With this method, job performance is measured after training by means of supervisor's rating (or other means), and, by using a norm reference, value is assigned to the gain in job performance and the dollar benefits the training produced are calculated. This procedure is based on the method Godkewitsch (1987) used, later published by ASTD in INFO-LINE publication #007, entitled "How to Conduct a Cost-Benefit Analysis" (1990). This method of cost/benefit analysis defines benefit as the effect of the training times the value of the training minus the cost of the training times the number of people who have been trained. The formula is $B = N [(E \times V) - C]$ (more about that later). The result is a dollar value that describes what the training is worth to the organization in terms of the performance of the workers who have participated in the training.

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Using dollars to describe the benefits of training has several advantages: (1) The dollar is a ratio measure of value; (2) The dollar has tremendous emotional appeal; and (3) It is the same measure that is used for the rest of the business.

## Cost/Benefit Analysis in Perspective

Kirkpatrick (1975) proposed 4 levels of evaluation: (1) Reaction Level, (2) Learning Level, (3) Behavior Level, and (4) Results Level. The present analysis is conducted at the behavior level. It measures trainee performance after training and compares it with a standard. True, the analysis could be conducted at the learning level. However, that would make the results less powerful, since measures of productivity gain seems to have greater value in most organizations than gains in learning.

## The Problem

Godkewitsch's formula, presented in his 1987 article, and reporduced in the ASTD INFOLINE Publication, was so poorly explained that neither the author of this paper nor the ASTD editor could clearly understand why it was supposed to yield a usable performance value. In thier explanation, the ASTD publication asked us to "Assume that the effect of the training (E) was .44 of the standard deviation of the 'before-and-after-training' change (established by management) (p. 13). What does this mean? Does management establish the change? Do they establish what .44 percent of the standard deviation of the change is? Why use standard deviations at all if the criteria were established by management? They go on to say that the "average salary of the trainees is $230 a day or $59,800, and monetary value of the standard deviation of job performance management decides is 40 percent of yearly salary or $23,920 (p.13). Why did management decide it was 40 percent of yearly salary? Could it just as easily be 30 percent, or even 70 percent? Is there no decision rule for the value of performance gain that explains *why* 40 percent is used?

## Method

To answer these questions Godkewitsch's 1987 artcle was examined. This, too, was found to have insufficient detail, but led to an original article on the subject, published in the 1986 *Journal of Applied Psychology*, by Burke & Day. The Burke and Day article contained the one essential piece of information which made Godkewitsch's formula understand able by giving it a useful reference point to establish the dollar value of the effect of training. The essential information concerns the expression of performance gain in terms of unit normal curve deviates; specifically, what is the dollar value of an increase in performance that equals 1.0 standard deviation, and why it is permissible to use that value, in the absence of other baseline information. With this information in hand it was possible to construct the following cost/benefit analysis.

## Five Steps to Benefit Analysis

The steps to benefit analysis by this method are: (1) Determine the effect of the training, (2) Determine the dollar value of the effect, (3) Find out how may people have been trained, (4) Determine the training cost per person, and (5) Put the information together. Let's try it on a sample problem.

**A Sample Problem for Analysis**

Suppose we train 25 persons in an important technical skill needed by the organization. The average salary of these trainees is $24,000 per year. The training was out-sourced off site and we had to pay for tuition, travel, living cost, and pro-rated salary. We have an itemized list of the training costs. After training, we obtained a supervisor's rating of job proficiency for each of the trainees and concluded that the training increased job proficiency by .42 Standard Deviations in the trained group. The question is: What is the financial benefit of this training?

**Step 1: Determine the Effect of the Training**

For this step, you need to find what has been the effect of the training and describe it in standard deviation units. For this step, use the distribution of job performance that persons in that job have displayed in the past. It will form the familiar bell-shaped curve, with a mean and a standard deviation. Now, calculate the average performance of your group after training and compare it with the typical job performance average, using standard deviation units. In our example, we have increased the average performance .42 standard deviations.

**Measuring Job Performance.**

In this example, we measured job performance by using the supervisor's evaluation. There are other ways, such as peer or colleague evaluations, observation of the person on the job using a checklist for desired behavior, and measurement of productivity (units produced per person per unit of time). Each has its pros and cons. The trainer must choose the best one.

**Step 2: Find the Dollar Value of the Effect**

In a meta-analysis of studies, (Burke and Day 1986) found that one standard deviation of improvement in productivity was worth an average of 40 percent of pay for the job. Thus, if an group improved 1 standard deviation after training, their performance is worth 140% of wage level to the company. Conversely, if it decreased 1 Sd, the performance value is worth 40% *less* than the wage level. Since we don't have any benchmarks for our particular company, we can use average figures, and find the dollar value of the effect by multiplying the annual salary by .40. The effect of our training is therefore $24,000 x .40, or $9,600.

**Step 3: Determine how many People were Trained**

This step is simple. We have but to count the number of persons who were trained. In our example, we trained 25 workers.

**Step 4: Find the Training Cost Per Person**

Finding the training cost per person is not difficult. Because we out-sourced the training, costs are readily available. We know that tuition cost was $1,200, travel $525, and living expenses $577, but how do we get the pro-rated salary for the 5 days the workers were in training?

We have the average wage of $24,000 per year and can assume 25% fringe benefits. We can also assume that we want to use full labor costs at 260 days per year (see the ASTD INFO-LINE previously cited). So, $24,000 x .25 = $6,000, which,when added back to the $24,000 salary, gives $30,000 in full labor costs. The $30,000 divided by 260 days is $115.38 per day,



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which, when divided by 8 gives $14.42 per hour. Our training program lasted 5 days, so the pro-rated salary cost is $14.42 x 8 hours x 5 days, or $576.80. Let's round it off to $577 for convenience. After adding $577 to the other costs, we find that the training cost per individual was $2,502.

**Step 5: Put it All Together**

All we have to do now is put the information into the formula and turn the crank (I promised we'd get back to that).

Using the formula B = N [(E x V) - C], we get:
B = 25 [(.42 x 9,600) - 2,502] B = 25 [4,032 - 2,502] B = 25 [1,530] B = $38,250

This means that our training program had a benefit of thirty eight thousand two hundred and fifty dollars (it sounds like more if you say it that way). Still, $38,250 is a nice piece of change!

**Advantages of this Method**

The cost benefit analysis method just described has several advantages: (1) It uses dollars as the unit of measure for the analysis; (2) This unit of measure is usually acceptable to managers because they understand it; (3) The method is relatively simple to use; (4) It does not require extensive computer capability or number crunching power; and (5) It provides results fairly quickly (you don't have to wait for a year-end budget report). On the other hand, there are some disadvantages.

**Disadvantages of the Method**

There are a few disadvantages: (1) This is a norm referenced method, with several attendant problems, (2) It relies on supervisor evaluations, which may be of doubtful validity and even more questionable reliability; (3) The value of one standard deviation improvement (40 percent of annual salary, based on other studies) is questionable, and should not be used if you have local benchmarks to compare it against; (4) The dollars calculated as benefits are not real dollars unless you do have your own validated benchmarks; (5) It may be difficult to tie the benefits to long term business results if the measures of productivity gain are taken shortly after training; and (6) The results do not answer the question "Did you train for the RIGHT skills".

**Sample Problem For Compact Cost/Benefit Analysis**

Suppose you trained 30 individuals on computer data processing skills. These persons do data entry and file manipulation, and are paid an average of $28,500 annually plus 25 percent fringe, or $137.19 per day. You sent them to Atlanta, Georgia, for training that was criticized as "too expensive" because the tuition was $1,600 per trainee. Moreover, the course lasted one and one half weeks (10 days), during which the trainees received full pay. Per diem in Atlanta was $65 and transportation was $250 per person. After the training you had each participant evaluated by his or her supervisor and you found that the training has increased the performance of the group an average of .48 Sd. You are convinced that 1 Sd gain in performance is equal to 40 percent of wage rates. What is the benefit of training, in dollars, to the company?

| *Training Cost* | | *Other Information* | |
|---|---|---|---|
| Tuition | _____ | Number Trained (N) | _____ |
| Travel | _____ | Effect of Trng (E) | _____ |
| Per Diem | _____ | Value of Trng (V) | _____ |
| Salary | _____ | Cost of Trng (C) | _____ |
| Total | _____ | | |

The "Benefit of Training Formula" is: $B = N [(E \times V) - C]$. Now, substitute into the formula and turn the crank!!

## Conclusion

Disadvantages notwithstanding, this method is probably worth using if you can establish your own benchmarks for the value of one standard deviation of productivity gain. The method is less complicated than many others and may provide useful justifications for the training enterprise. Now, it is your turn to try a "compact" cost/benefit analysis. Just work through the sample problem at the end of this paper. And think about how you might be able to use some of these techniques to justify your training endeavors.

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# Free to Choose; Returns on Investment in Education in the Netherlands

*Joop G. Odink,*
*University of Amsterdam*

*Ruurd Kunnen*
*Organization of Strategic Labor Market Research, The Hague*

***In The Netherlands expected (marginal) rates of return for 35 educational paths differ strongly, for both different levels and for different subjects within the same level of education. Private rates of return are somewhat larger than social rates; public sector rates are the smallest. They are low compared to other countries. However, rates based on cross section analyses should be low, if the reference interest rate is corrected for expected wage rises.***

Large sums of money are spent in The Netherlands on education and training every year. The 1994 budget of the Ministry of Education and Science amounts to over NLG 33 billion (100 NLG = US $ 58). The total costs of internal and external training provided by companies in the private sector amounts to over NLG 3 billion. These large expenditures reflect the great importance that is attached to high-quality education in The Netherlands. However, these large sums give only a first approximation of the costs of education. Direct costs paid by students themselves have not yet been accounted for, nor the opportunity costs. For students themselves forgone earnings are far and away the most important costs. In the interest of simplicity many empirical studies therefore deal with those opportunity costs only. Forgone net wages are related to forgone gross wages and therefore to forgone taxes and social security contributions. As such, opportunity costs are not only an important part of individual or private costs but also of social costs of schooling. Total costs for the public sector consist not only of direct costs but also of these forgone taxes and social security contributions.

Since Becker (1964, 1975) and Mincer (1958, 1962, 1974) many papers have been devoted to measuring the costs and benefits of education especially in terms of the internal rates of return of investments in education. By definition the expected internal rate of return is the rate of discount that equates the present value of the expected investment stream to the present value of the expected (additional) benefits stream. In this paper expected rates of return for Dutch data are analyzed. The rates might be calculated for net as well as for gross or social investments and revenues: Private and (marginal) social rates of return. Under many assumptions the difference between gross and net costs and revenues might be interpreted as costs and benefits for the public sector.

The freedom of choice allows the Dutch student to choose from many educational paths, all with their own expected rates of return. In section 2 we discuss who is the central agent in the investment decision. In section 3 we discuss some major points of the Dutch educational system. The costs and revenues are discussed in section 4, calculation methods of the rates of return and the reference interest rate in 5, and the main results for The Netherlands in 6.

## 2 Investment in Education as Household Production

The view that investment in education increases human capital is already stated by Adam Smith (1776): "A man educated at the expense of much labor and time ... may be compared to one of those expensive machines".

The question is now: "Who is the central agent deciding to invest?" Investment in education is not

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simply investing some amount of money, nor simply teaching. Education improves human capital. The accumulation of human capital as such is the output of household production. So the student is the producer, not the school. He/she is the central agent in the processes of teaching, learning, accumulating and using of human-capital; see figure 1.

**Figure 1 Learning, Teaching, Accumulation and use of Human Capital**

| | | inputs | outputs |
|---|---|---|---|
| 1 | production | - manpower (teachers)<br>- other direct costs | teaching |
| 2 | household production (learning) | - teaching<br>- time<br>- direct costs (e.g. books) | accumulation of human capital |
| 3 | a production | - increased human capital | increased productivity |
| | b household production | - increased human capital | other benefits |

Teaching as such is an intermediate product only; for the student it is an input in the household production of accumulation of human capital. Finally, the accumulated capital should be used in production and/or household production to generate benefits of education. Here again the student is the central agent who decides whether his capital will be used or not.

Figure 1 gives only a raw sketch. For instance transfers and taxes are not included. Direct costs of teaching may be partially financed by students (or by their parents) in the form of tuition fees. Student allowances might partly compensate for the opportunity costs of the time invested in learning. The input of increased human capital might result in higher productivity as well as in higher satisfaction for the employee himself. Although job satisfaction is often mentioned, the Dutch data do not show any positive relation between job satisfaction and the educational level.

### 3 The Dutch School System and Different Educational Paths

One of the most striking features of the Dutch system is the combination of the almost complete centralization of the administration by the state along with the fact that the great majority of basic and secondary schools are private. This is due to the great school struggle between roman catholics and protestants in the nineteenth century which resulted in the right for every (e.g. religious) group to have its own schools financed by the same system as the public schools. This results in the remarkable fact that there are hardly any differences in school quality between different schools of the same type, nor between private and public schools.

The *first level*, basic school, consists of a uniform program of eight years schooling (age 4-12) of which seven compulsory (age 5-12).

The *second level* consists of another six compulsory years of schooling; four full time (age 12-15) and another two years (age 16,17) full time or part time (apprenticeship). All the secondary schools have now to teach the same 15 subjects during the first three years of compulsory education, although at different levels. These subjects are almost all non-vocational. There are four different levels (in ascending order) of four to six years of schooling before graduating:

**VBO**, 4 years pre-vocational (until recently junior vocational: LBO),
**MAVO**, 4 years junior secondary
**HAVO**, 5 years senior secondary
**VWO**, 6 years pre-university (grammar school)

Until recently, at the age of twelve years, the (parents of) school children had to choose between vocational (LBO) and non-vocational education.

*Completed schooling* implies in general four additional years of schooling: senior vocational (**MBO**), higher vocational (**HBO**) and university (**WO**). Standard (short) paths are the paths where the highest level is chosen that is allowed according to the secondary school exam:

VBO -> MBO, MAVO -> MBO, HAVO -> HBO, and VWO -> WO

So at first sight there are for the student, only two important decision moments in his school career. At the age of twelve years the parents decide between four different levels. This choice is strongly influenced/rationed by the results of the Dutch SAT test and the advice of the principal of the primary school. This choice does not involve any financial investments for the student. The second choice is much more important. The student chooses between the labor market and finishing a complete school career. For the student, for the parents and for the public sector this is a choice with substantial financial consequences. It is important to note that this decision is not about one additional year of schooling but of four or none additional years. Differences in total schooling years for standard paths are due to differences in secondary schooling and reflect also differences in level that cannot be chosen freely.

***Free to Choose*** Continuous choice in the number of years can be made by the student by "choosing" to drop out at any moment. However, the consequences of dropping out (about 30%) are not analyzed here, because information about dropping out is not contained in our data sets.

In secondary education there are many (re)switching opportunities for the pupil. At the end of each school year pupils in general are allowed to choose for one level lower without losing a year even if they failed to pass. After the first year they might choose for one level higher if they have good marks. After graduating secondary school they have the right to choose for another secondary school one level higher, losing one year.

Furthermore, Dutch students have the choice of many other possibilities too. Within the system *"stacking" paths, long educational paths* and *roundabout paths* are allowed. Stacking means that after the student has completed a certain path he/she takes a second course. For example after MBO a HBO course or after HBO a university course, or even MBO-HBO-university is a possibility. Long paths begin with a level that is lower than necessary. For example MAVO-HAVO-HBO or HAVO-VWO-university. Both paths cost an additional year of schooling compared with the standard path. Finally, roundabout paths are paths which include an unnecessary intermediate stage. For example HAVO-VWO-HBO cost two additional years. Recent data (Commissie Leerwegen, 1995, pp.46-50) show that of a 100 HAVO-graduates only 41 choose for HBO, 26 choose MBO (roundabout path) and 16 VWO (long path); 4 choose for the dual system and 13 leave the school system. Of a 100 new HBO students only 39 are HAVO-graduates, 30 MBO (stacking path), 21 VWO (roundabout path), 4 HBO (roundabout and stacking), 1 university (roundabout and stacking) and 5 other. These data show that it is not only possible to choose a path other than the standard one, it is very frequently done. So in fact the Dutch student has many more choices than simply following or not the standard path. The Dutch government is now preparing new laws to reduce the number of students choosing such more or less inefficient paths.

Finally, it should be mentioned that graduating gives formal rights. A VWO exam for example entitles the student, among other things, to choose for a study of law at any of nine Dutch universities with a department of law or economics at any of the six universities with a department of economics. The university departments have not the right to select new students. Selection takes place at the end of the first year. Therefore the dropping out rates are high.

**4 Costs and Benefits**

***Direct and Indirect Costs; Private and Social Costs*** In the cost-benefit analysis of investment in education, costs and benefits are only accounted for if they are measurable in financial terms. Furthermore, in many analyses of the private rates of return, following Mincer, only the costs of time are taken into account. This might be correct if the direct costs (books) and tuition fees are equal to additional income from part-time jobs, student allowances and grants. In our analyses of private returns the costs of time as well as the direct costs, including tuition fees, are accounted for. Total private costs are corrected for student allowances, which are substantial in the Netherlands. However, transfers from parents to children are not deducted. In this respect total investment by the student himself might be substantially lower and in fact private rates of return for the student himself might be substantially underestimated as they are calculated for student and parents together.

*Marginal social costs* are the costs of an additional student for the society. They are equal to the direct costs plus the opportunity costs. Under the assumptions of full employment and perfect competition the social opportunity costs of a student are equal to the gross reduction in gross earnings, it is the net forgone private earnings augmented by forgone taxes, social security contributions etc.; in short: Taxes. Marginal social cost might be divided between the private costs and the costs for the public sector. Even if all direct costs were paid by the student and his parents the costs of education for the public sector in the sense of forgone taxes would be substantial, especially in our Dutch data. So if the student decides to invest in education the public sector is investing also.

***Private Benefits*** Financial private benefits of education are equal to the additional net income stream that is related to the increased productivity. To calculate this is a complicated matter. According to Willis (1986) there are two fundamental problems in calculating this additional income stream:

a) it is impossible to observe the life cycle earnings path of the same individual who has made alternative schooling (or post-school) investments;

b) it is impossible to observe all the variables (e.g. ability) which determine the earnings opportunities.

As the students select for themselves the most preferred alternatives from their opportunity sets, in general the additional income stream related to an additional course, school or year is lower than the difference between the realized earnings stream after the additional schooling and the income stream attributed to one level lower that is earned by students who didn't take such an additional course. Our data sets don not contain in our opinion sufficient information to solve the selection problem correctly. For reasons of simplicity we made calculations based on 100% of those differences as well as based on 60%, a rough mean outcome of many estimations. So at first sight the maximum benefits are equal to the differences between the earned income streams. If a student, however, chooses to take additional schooling just because he is not able to find a job, the income differences might be greater than 100%. So even at 100% attribution of income difference to education returns might be underestimated. In general, however, this will not be the case. An important problem of selection remains however. It is not correct to assume that students who did not choose for the additional schooling would have been able to earn the same additional income if they had. As the student is the central agent in the decision model it is, in fact, his point of view that is decisive. If he/she thinks 60% of income differences are related to additional education and 40% to own abilities than 60% is important for his/her decision to go on investing further.

***Ex ante and ex post Benefits.*** A second problem of calculating the earning benefits attributed to schooling is that the student who decides to follow an additional course is interested in expected additional income, not in realized earnings of others in the passed 50 years. For ex post rates of return historical earning paths are important. Life time micro data are not available. Available are, in general, cross sections data, sometimes combined with panel data for a relatively short period. If cross section data are used no correction is made for expected real and nominal rises in wages in the future, nor for changes in income distribution. If wages are expected to rise in the future, either expected net earnings differences should be corrected or the reference interest rate should be adapted (see below).

***Marginal Social Benefits and Public Sector Benefits*** Marginal social benefits of education for an additional student are not simply equal to his additional gross income. Social benefits may include social and cultural revenues of education such as democratic functioning of the society, its mutual solidarity, increasing health (see Weale, 1993) and economic benefits such as increased growth. Positive second



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order effects include increased marginal productivity and therefore higher wages of lower educated employees. Negative second order effects include displacement of lower educated people in times of unemployment. Furthermore, graduating might have consequences for screening which are better for the student himself than for society as a whole. Concluding, only in so far as all those effects together might result in no additional effect for total social welfare, additional gross income might be interpreted as marginal social benefit of additional education. Marginal benefit to the public sector is then equal to gross minus net earnings: Additional taxes and social security contributions.

## 5 Rates of Return on Investment in Education

By definition the expected internal rate of return on investment in education is the rate of discount that equates the present value of the expected investments (costs) stream to the present value of the expected (additional) benefits stream. The rates of return are calculated in this paper according to the formula:

$$\sum_{t=1}^{T} C_t/(1+\rho)^t = \sum_{t=1}^{T} R_t/(1+\rho)^t$$

where $R_t$ is the (expected) additional benefit in year t, $C_t$ the (expected) additional costs in year t, and $\rho$ the (expected) rate of return.

Investment in education is profitable if the internal rate of return ($\rho$) is greater than the reference interest rate (r). This reference interest rate is not a nominal interest rate but a nominal interest rate corrected for expected rises in wages, and a premium for risk. According to the "golden rule" in the long-run the interest rate tends to be equal to relative rise in wage rates. For The Netherlands this happened to be true for the annual gross wage rate per hour and the interest rate on perpetual bonds over the period 1875-1980 (Odink, 1985). Shorter periods show, however, dynamic changes. For the period 1940-1975 the interest rate was substantially lower than the rise in the hourly wage rate of blue color workers in the metal industry, while since then the opposite is the case. In the case of the golden rule the reference interest rate would be equal to a risk premium only, unless a decrease of income inequality is expected. In many publications rates of return of over 10% have been found and even over 20% (e.g. Psacharopoulos, 1985). According to our view those high rates of return indicate under-schooling.

In this paper private, social and public sector rates of returns on investment in education are calculated. Differences in the calculated rates are due to differences in transfers, such as student allowances and tuition fees far below the costs, and to the tax system. In the simplistic case, without any direct costs the investments of the public sector are related to the mean tax rate while the public sector benefits are related to the marginal tax rate. If the marginal rate is higher than the mean rate, as is the case if the tax system is a progressive one, the benefit cost ratio will be in favor of the public sector relative to that of the student. So the rate of return tends to be higher for the public sector than the private return as the tax system is a progressive one. In The Netherlands taxes are highly progressive, see tables 1 and 2 where 55-60% of additional gross earnings are taxes and social security premiums.

## 6 Internal Returns to Investment in Education in the Netherlands

Expected rates of return are calculated for different data sets. Gross 1989-wages according to the Dutch CBS (1992) and net wages according to OSA 1990-panel data. With the Dutch CPB Micro-tax program net wages are recalculated to gross wages and vice versa. So for both data sets private as well social rates of return could be calculated.

Table 1 **Costs, Benefits and Expected Rates of Return for Higher Vocational Education in The Netherlands**

| *Cross Hourly Wages 1989 (CBS, 1992); HAVO/VWO -> HBO* | | | |
|---|---|---|---|
| | social | private | public sector |
| | (in 1000 NLG) | | |
| opportunity costs | 121 | 40* | 80* |
| total costs | 179 | 52 | 127 |
| total benefits (100%) | 307 | 120 | 187 |
| balance (60% benefits) | 5 | 20 | -14 |
| balance (100% benefits) | 128 | 68 | 60 |
| rate of return (60%) | 0.1% | 1.3% | -0.5% |
| rate of return (100%) | 2.2% | 3.7% | 1.6% |

* corrected for transfer payments (allowances, tuition fees)
Source: Odink and Klijnstra (1994)

***Dutch CBS 1989-Wages*** For HBO and WO Odink and Klijnstra (1994) calculated (expected) social, private and public sector rates of return. The benefits have been calculated from regression analyses by the CBS (1992) on the 1989-data set, using among other things dummies for age, gender, industry and dummies for seven different school levels, both for benefits being equal to 100% and 60% for earning differences for full timers. Table 1 and 2 show that public sector rates of return for HBO and for WO are substantially lower than private ones; social rates are in between. This is due to the relatively high student allowances and low tuition fees in 1989. Note that even for the public sector the opportunity costs (corrected for allowances and tuition fees) are substantially larger than the direct costs. Rates of return for university are substantially higher than for higher vocational (HBO). This can be partly due to the fact that the Dutch CBS grouped wages of VWO and HAVO graduates together.

Table 2 **Costs, Benefits and Expected Rates of Return for University Education in The Netherlands**

| *Cross Hourly Wages 1989 (CBS, 1992); HAVO/VWO -> WO* | | | |
|---|---|---|---|
| | social | private | public sector |
| | (in 1000 NLG) | | |
| opportunity costs | 159 | 54* | 105* |
| total costs | 254 | 70 | 184 |
| total benefits (100%) | 1003 | 438 | 566 |
| balance (60% benefits) | 348 | 192 | 155 |
| balance (100% benefits) | 749 | 367 | 382 |
| rate of return (60%) | 3.4% | 5.6% | 2.3% |
| rate of return (100%) | 5.7% | 8.3% | 4.5% |

* corrected for transfer payments (allowances, tuition fees)
Source: Odink and Klijnstra (1994)

***Decreasing rates of return in The Netherlands*** According to Groot (1992) rates of return for higher education were stable during the period 1965-1985. However, Table 2 shows that this is no longer the case. In the case of 100% benefits figures for The Netherlands are comparable over time. Private rates of return fell sharply in 1989; for university from about 12% to 8 and for higher vocational from 9% to 4%. Social rates of return for university did not change and are still about 6%, while higher vocational social returns declined from about 7% in the early seventies to 2% in 1985 (See also Koss-Fiszer (CBS),1988) and in 1989.

***OSA 1990-data*** Net wage equations were estimated for different levels of education using OSA 1990-panel data with among others age and age-squared as continuous variables and gender and subject (technical, economical etc.) as dummies. Net wages were recalculated to gross wages. For 35 educational paths, based on 60% income differences the results are given in Table 3.

The striking results are:

Relatively low rates of return to education as compared to empirical outcomes for other countries. However, rates of return of 3% might still be considered as fair, remembering that the reference interest rate might be lower.

Astonishing differences among different paths, varying (in percentages) for private returns from -3 to +7 for males and from -4 to +8 for females and for social rates of return from -4 to +6.

Even within the same level there are substantial differences between subjects of schools. HAVO-HBO from +2 to +8 for males, from -1 to +6 for females and from -1 to + 5 for social rates of return.

Finally, some long and stacking paths can give quit good results e.g. :
MAVO-HAVO-HBO (economic,) rates being +5, +6 and +5 and
MBO(economic)-HBO(economic) rates being +7, +6 and +5 respectively.

Finally, calculations have been made for full timers in hours and years (until age 65). Non activity has consequences both for opportunity costs and for additional incomes. If inactivity is taken into account some rates of return decrease while others increase or remain constant.

## 7 Discussion and Conclusions

Dutch students have great freedom in choosing their educational paths. However, continuously choosing can be realized only by dropping out. Standard routes have two moments of choice, at age 12 by their parents and later on after graduating from secondary education they can choose to go on for four additional years. Many alternative paths are allowed, but additional schooling will take in general two or more additional years of investment in education. Long, stacking and roundabout paths are allowed. Therefore a different number of years can correspond with the same final level. In this paper 35 different routes including different subjects within the same level are analyzed. In general the rates of return are lower than in most other countries now. Furthermore, they are lower than in the past. It is argued that in using cross section earnings data the reference interest rate should be very low, somewhat higher than a risk premium will be sufficient, unless income inequality is expected to diminish substantially. So in our view over-schooling is not generally the case. The 35 different paths, however, show great variation, for both different levels and for different subjects within the same level. Many routes are not profitable. We also calculated marginal social rates of return and rates of return for the public sector. The rates for the public sector are the lowest, the social rates are in between. Even if the public sector does not invest in higher education it will still invest forgone taxes and social security contributions and receive additional taxes and social security contributions, the benefits being based on the higher marginal tax rates.

**Table 3 Private and Social Expected Rates of Return to Education in the Netherlands in 1990 (60% earning differences)**

| Path | private | | social |
|---|---|---|---|
| | male | female | |
| lbo-mbo | 3 | 6 | 4 |
| lbo(t)-mbo(t) | 2 | 5 | 3 |
| lbo(e)-mbo(e) | 3 | 6 | 5 |
| lbo(v)-mbo(v) | 4 | 7 | 4 |
| mavo-mbo | -2 | 1 | 0 |
| mavo-mbo(t) | -3 | 1 | 0 |
| mavo-mbo(e) | -2 | 2 | 0 |
| mavo-mbo(v) | -2 | 2 | 0 |
| mavo-havo | 4 | 7 | 5 |
| havo-hbo(t) | 5 | 3 | 2 |
| havo-hbo(e) | 8 | 6 | 5 |
| havo-hbo(v) | 2 | -1 | -1 |
| havo-hbo(o) | 3 | 0 | 0 |
| mbo(t)-hbo(t) | 6 | 4 | 3 |
| mbo(e)-hbo(e) | 7 | 6 | 5 |
| mbo(v)-hbo(v) | 3 | 1 | 1 |
| vwo-wo | 4 | 2 | 2 |
| hbo-wo | 5 | 5 | 3 |
| mavo-havo-hbo | 3 | 4 | 2 |
| mavo-havo-hbo(t) | 4 | 4 | 3 |
| mavo-havo-hbo(e) | 5 | 6 | 5 |
| mavo-havo-hbo(v) | 2 | 3 | 1 |
| mavo-havo-hbo(o) | 3 | 3 | 2 |
| mavo-mbo-hbo(t) | 3 | 3 | |
| mavo-mbo-hbo(e) | 3 | 4 | |
| mavo-mbo-hbo(v) | 2 | 2 | |
| lbo(t)-mbo-hbo(t) | 6 | 7 | 5 |
| lbo(e)-mbo-hbo(e) | 7 | 8 | 6 |
| lbo(v)-mbo-lbo(v) | 5 | 6 | 4 |
| havo-mbo-hbo(t) | 1 | -1 | -1 |
| havo-mbo-hbo(e) | 3 | 2 | 1 |
| havo-mbo-hbo(v) | -1 | -4 | -4 |
| havo-vwo-wo | 5 | 3 | 3 |
| mavo-havo-vwo-wo | 4 | 4 | |
| vwo-hbo-wo | 4 | 3 | 3 |

e (economical), t (technical), o (educational), v (health)
Source: R. Kunnen and J.G. Odink (1994, p. 119)

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# The Impact of Values on the Financial Analysis of HRD

*Jennifer Gail Parsons*
*Oklahoma State University*

*It has become fashionable today to analyze the financial costs and benefits of human resource development (HRD) programs. But before everyone embraces financial analysis as a panacea, the effects of using these tools should be examined. Like all tools, financial analysis can produce both benefits and problems. In this paper, I will discuss the benefits and problems inherent in using HRD financial analysis tools and emphasize the impact that values have on the results.*

It has become fashionable today to analyze the financial costs and benefits of human resource development (HRD) programs. Phillips (1994) pointed out that few topics generate as much interest among HRD professionals as return on the investment. Not surprisingly, many recent books and articles detail HRD financial analysis models (e.g., Head, 1985; Mosier, 1990; Swanson & Gradous, 1988). Additionally, the literature contains case studies that document the use of financial analysis within functioning organizations (e.g., Jacobs, Jones, & Neil, 1992; Prifrel, 1985; Sleezer, Cipicchio, & Pitonyak,1992). The emphasis on HRD financial analysis is highlighted by Carnevale and Schulz (1990), who stated that human resource development (HRD) professionals reluctant to account for training, need to reorient their thinking to face the business realities of the 90s (p. 2).

But before everyone embraces financial analysis as a panacea, the effects of using these tools should be examined. Like all tools, financial analysis can produce both benefits and problems. In this paper, I will discuss the benefits and problems inherent in using HRD financial analysis tools. I will emphasize the impact that values have on the results. To provide a basis for this discussion, I will examine some HRD financial analysis tools, and describe how practitioners currently use them.

## Financial Models for Measuring HRD Programs

Gilbert's (1978) theorems for defining, measuring, and engineering human performance are considered to be seminal in the HRD field. In describing his first theorem, Gilbert noted that "human competence is a function of worthy performance (W), which is a function of the ratio of valuable accomplishments (A) divided by costly behavior (B)" (p.18). Worthy performance, then, is that performance "in which the value of the accomplishment exceeds the cost of the behavior" ( p.17).

HRD professionals have expanded on Gilbert's work and have developed mathematically-based formulas for measuring the financial aspects of their programs-to the penny. Examples of recent books on the topic include *Training Cost Analysis* (Head, 1985), *Costs, Benefits, and Productivity in Training Systems* (Kearsley, 1982), *Calculating Human Resource Costs and Benefits* (Spencer, 1986), *In Action: Measuring Return on Investment* (Phillips, 1994), and *Forecasting the Financial Benefits* (FFB)(Swanson and Gradous 1988). These books present specific formulas and forms for calculating costs, accomplishments, and worthy performance. For example, Figures 1 and 2 on the next pages show the performance value and cost forms used in the FFB Model (Swanson & Gradous). According to the FFB Model, the financial benefits of a program are determined by subtracting the costs of the program from the forecasted performance value of the program.

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**The Application of Financial Analysis Models**

The literature documents many applications of financial analysis models for measuring HRD efforts. Carnevale and Schulz (1990) identified how some companies such as Polaroid, Upjohn, Vulcan Materials, AT&T, Arthur Anderson, Aetna, and Chase Manhattan Bank rely on financial analysis models when making corporate training decisions. For example, Carnevale and Schulz noted that Polaroid's management has decided to undertake training only if it will affect the bottom line. Further, they evaluate training program with the same standards and units that local managers use as performance standards.

More detailed examples of HRD financial analyses are available in a recent book by Phillips (1994) which provides 18 cases. In each case, the author describes a specific situation, the tools and processes used and the outcomes that resulted. For those seeking more rigor, research studies are available that document specific processes and the results of using financial tools. For example, a research study by Jacobs, Jones, and Neil (1992) documented the financial benefits of structured on-the-job training. Sleezer, Cipicchio, and Pitonyak (1992) documented financial worth as part of a larger evaluation effort to assess the effectiveness of two HRD programs, a computer training course and a total quality flow-charting course. Swanson and Sleezer (1989) reported the process and results of calculating the financial worth of an organization development program.

An examination of these cases reveals that HRD professionals currently use financial tools for both strategic and tactical decision making. In addition, they use the tools to justify programs, direct resources, and rationalize choices.

**Benefits and Problems with Using Financial Analysis Tools**

Financial analysis tools offer many benefits. First, these tools help HRD practitioners to look at their programs through their customers' eyes and to ask the questions... What does this program really do for the customer? And, at what cost? The customers of HRD programs could be internal to the company or they could be external. The tools also help HRD professionals to answer these questions using a language that is important to the customer (dollars and cents).

Second, these tools guide practitioners in talking with other stakeholders about their programs. Effectively using these tools requires HRD practitioners to acquire broad-based information about their program from a performance perspective. Financial analysis, then, can serve as an impetus for communicating with customers and other stakeholders about program expectations and for gaining consensus about accomplishments and costs.

A third lure of HRD financial analysis tools is that they provide a seemingly rational way of making decisions. After all, a few numbers can be inserted in a preexisting formula, several calculations made and--voila! answers are obtained that seem hard to dispute. Because HRD financial analysis tools rely on logical and reasoned processes that fit with most organizational budgeting processes, these answers can be used within many departments or firms to justify current budget allocations or to lobby for additional resources. As Mosier (1990) pointed out, training and development is big business; therefore it should be evaluated in the same way as other large investments, in terms of costs and benefits . . . the same applications as are used to justify capital, land, or other resources can be used to justify training and development (p. 45). HRD financial analysis facilitates comparing HRD programs with other types of investments required for organizational operation and growth.

Financial analysis tools can be a powerful addition to an HRD professional's toolbag--but only if they are used appropriately and if their limitations are understood. The following paragraphs identify some of these limitations.

First, financial analysis tools are uni-dimensional. They can be compared to a grocer's produce scales. Even if calibrated accurately, a scale measures only weight. It ignores other important produce characteristics such as freshness, smell, and visual appeal. Similarly, financial analysis tools capture only those aspects of performance that can be translated into dollars and cents. They ignore characteristics that may be important to the organization's long-term success, but that cannot be translated into financial terms. Examples of these characteristics include loyalty and company image.

When HRD professionals and the corporate decision makers determine value to mean "bottom line" or economic value alone, a choice has been made to adhere to a philosophy defined by early classical

economists and Marxist philosophy, where labor and only labor is seen as the true origin of every value (Janowski, 1993, p.43). "Western society is so enamored of the efficiency and productivity of its space age technology that any activity that is not efficient and productive simply does not, literally, measure up, and so is of little or no value" (Guy, 1991, p.287). What then becomes of the value cost factor to individuals, or teams or corporations? How do human values and corporate values fit in the evaluation tools of predicting and measuring high performance? If personal values that carry little direct financial value, are powerful enough to impact team values, and team values ultimately have the power to influence corporate values and visa versa, then how can it be denied that the individual value of one can cripple the overall value of the larger whole.

As Moltiere notes in *Les Precieuses Ridicules* "things are worth what you make them worth" (Rawson, 1988, p. 389). Such an idea could certainly speak to such issues as homelessness in the country or even the intrinsic beauty of a Troll doll. How can we not consider the power of these value systems? It was Karp and Abramms who stated, "in organizations, clear values drive mission statements, strategic plans, and effective, result-orientated behavior" (1992, p.38). Values are not simply attitude coats-of-armor that identify human differences; they provide a framework from which all things can be hung. When an organization is found operating in chaos, probably the value system of the organization is colliding with the values of groups and individuals who comprise the organization. Deal and Kennedy (1982) stated that "values are the bedrock of any corporate culture" (p.21). "These values constitute a philosophical position on what the organization thinks is important. In a way, the values can be considered the organizational personality, and this can set one institution apart from another" (Caffarella and O'Donnell, 1987, p. 4).

Abbarno illustrated the importance of values when considering the role of an individual and the moral character that is acted out by individuals in their life roles. He noted that "your identity as a morale character permeates your conduct and establishes expectations among members of the community" (1993, p.311). Thus it can be seen that values embrace a cost which much be analyzed when evaluating performance. "Ethical people can be brought down by serving in a bad organization, just as people with questionable ethical integrity can be uplifted, or at least held in check, by serving in a good one" (Brown, 1987, p.68).

The use of HRD financial analysis tools reflects values. As discussed above, that is a strength of the tools and also a limitation: One way of seeing things is simultaneously a way of not seeing other things. To minimize this limitation of HRD financial analysis it can be important to consider values and to ask the following questions:

1. Whose values are reflected in the analysis?
2. Are the values reflected in the analysis representative of individuals, a group, the dominant culture?
3. How do the calculations and results change if the values of other individuals or groups are used?

A second limitation of HRD financial analysis tools is that they have difficulty measuring aspects of performance where the feedback between action and effect is less immediate or direct. But this is exactly the kind of performance that organizations are increasingly relying on for competitive advantage. For example, Taylor (1994) reviewed the Collins and Porras (1994) book and stated that they examined great companies of the industrial era for lessons on the organization of the future. According to Taylor, Collins and Porras found that the first achievement of great companies is to create shared meaning. Instead of first concentrating on getting a visionary product and, then, riding the product's life cycle, these companies focus on building organization traits. Although most would agree that HRD professionals should play a key role in this task, using financial tools for measuring the effects of such efforts would be difficult at best. A study by Cox focused on measuring aspects of successful team work and found "most important of all, the teams that are truly value-added to their organizations are those committed to a set of core values that ensure quality performance" (1991, p.21). If a commitment to core values is important to performance how can it be evaluated? Who determines those core values? How can you get people to buy-in to them? And exactly how much are core values worth in financial terms? For example, Disneyland is frequently identified as a successful organization that relies on training for sharing and reinforcing its culture. The theme park's employees learn that they are on stage for a performance while at work and the importance of maintaining their persona. Because the effects of these training

efforts pervade the organization, how could one use financial analysis tools to separate the economic worth of the training? Values are important but difficult to quantify. So, do we as professionals disregard data just because we have been unable to develop tools to measure or control for it?

Another limitation of HRD financial analysis is that it is only as useful as the information and values upon which it is based. The analyst's values or biases affect the analysis process and the results. For example, Gilbert (1978) stated that "great accomplishments are not worthy if the cost in human behavior is also very great. In my opinion, the Egyptian pyramids stand as silent monuments to worthless achievement, although the subculture of knowledge would have us honor them" (p.18). In making the aforementioned statement, Gilbert illustrates a decision based on his personal value system and, simultaneously, acknowledges an alternative perspective. As this example illustrates, an actual situation can elicit multiple paradigms of worthy performance, valuable accomplishments, and costly behavior. If an analyst uses a paradigm for performance that does not fit well with the actual situation, then the resulting benefits, while written in concrete terms, could function within the organization as a vehicle for misinformation. Kauffman (1980) illustrated this point with a story of a "hot shot" salesperson. The salesperson while heeding the directives of management to sell almost destroyed the company's credibility by writing more orders than manufacturing could produce and, thereby, creating a major system failure.

So, just how useful are our current paradigms for performance? Taylor (1994) pointed out that most of our ideas about work and organization that were born in the Age of the Machine do not apply today in the Age of the Network. He also pointed out that understanding the promises and challenges of work in today s economy requires radically new models and metaphors that go well beyond the stale rallying cries of teamwork or empowerment (p. 66).

Some of the new models being developed rely on systems and chaos theory and, therefore, recognize the importance of trial and error, experimentation, messiness, and conflict However, the current HRD financial analysis tools do not recognize that behaviors viewed as costly from one perspective (e.g., a short-term perspective) could be beneficial or even necessary from another perspective (e.g., a long-term perspective).

Many of the HRD financial analysis cases that have been reported in the literature rely on traditional paradigms of individual and organizational performance. For example, many of cases in the Phillips' (1994) book focus on improvements in the current situation.

## Conclusion

The financial analyses that we conduct reflect our values and our understanding of essential individual and organizational performance. These tools provide many benefits. For example, HRD professionals can use these tools to make decisions, to consider their programs from their customers' perspectives, and to justify budget requests. Using the financial language of business is key for HRD professionals who want to be considered as peers in their business organizations.

There are also problems with using HRD financial analysis tools. For example, we should measure what is important in our organizations, not what is easy to measure. However, in our profession we do not yet have a clear understanding of the components of organization performance and how they interact to influence process and outcome. Senge (1990) and others have pointed out that the perception that the world is created of separate, unrelated forces is an illusion. Yet, the HRD financial analysis tools available today measure a single benefit (money) of a single force (an HRD program).

In addition to developing a better understanding of the interactions that influence worthy individual and organizational performance, we need to develop better measurement tools and to understand how our own values influence the measurement results that we obtain. Even when the financial calculations are accurate, they are limited by the scope and values of the analyst and decision makers within the organization.

The financial analysis tools of today provide us with a new view of HRD's contribution to individual and organizational performance. An analogy is the development of the astronomical tools. When Galileo first constructed the lens telescope for astronomical purposes in 1609, it was a powerful tool that revealed new views of the sky. He used the tool to discover such things as the four brightest moons of Jupiter, lunar mountains, sun spots, and the starry nature of the Milky Way. Substantial advancements in astronomical tools allowed a closer and more detailed look at Jupiter's atmosphere with



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the Voyager I in 1979. With this view, we obtained a better picture of reality and learned of additional satellites and moons. The financial analysis tools of today are like Galileo's telescope and, oh, what a view they provide! Imagine the future possibilities.

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# The Economic Returns Of Education And Training From A Labour Market Point Of View[1]

*Ruurd Kunnen*
*Organisation for Strategic Labour Market Research (OSA),*
*Van Stolkweg 14, 2585 JR, Den Haag, The Netherlands*

*Joop G. Odink*
*University of Amsterdam,*
*Roetersstraat 11, 1018 WB Amsterdam, The Netherlands*

***In labour market research, much attention has been paid to the investigation of the relationship between education and work. The main problem was to acquire knowledge about the skills and attitudes workers need to fulfill their jobs, and which, on the macro- level, constitute the demand for labour in a qualitative way. The educational system itself was not a topic for labour market researchers. The only item they articulated was the importance of adequate communication between the educational system and industry. The educational system was more or less considered as a black box, the most important of which was the input (information) and the output (adequately skilled people). By doing so, labour market researchers were not able to contribute to the discussions about the future organization of the educational system. The last three years, OSA has developed a research-line which opened up new opportunities. In fact, we have tried to combine two existing fields of research, i.e. the educational-economic research on the rate of return of investments in education and the labour market research. To make the educational system a party interested in labour market policies, OSA formulated as the main question: How can the economic returns of education be improved from a labour market point of view?***

## The Complex Relation Between Education, The Labour Market, And Work

The idea behind our research-line is that investments in school-based education are to be 'earned back' by the working of the people that have been educated. However, the relationship between education and work is not a simple one (see figure 1). First, the two systems are not immediately related to one another, but they are linked by the labour market. On the labour market, qualitative matching problems between supply and demand usually occur. That means that the occupational or qualitative structure of the labour supply does not fit the qualitative structure of the demand side. These kinds of problems may be caused by a malfunctioning of the labour market, but also by pupils' and students' choice of courses taken.

Secondly, even if on the individual level the match between supply and demand is not perfect, a work relation may be brought about. In that case, the labour market problem is transposed to the shop floor. For a number of reasons, the workers' qualifications may not fit the qualifications required for the job even when no matching problems have emerged on the labour market. There exists a discrepancy between the worker's qualifications and the qualifications that are required to do the job adequately and to obtain maximum productivity.

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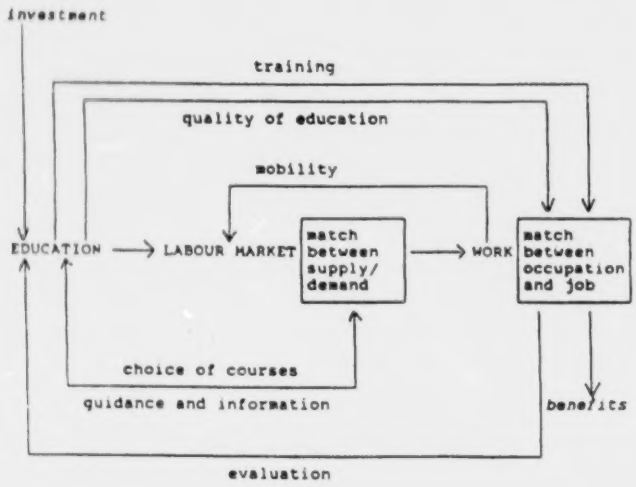
[1] The authors wish to thank Henk van Stiphout and Jean-Paul Vosse for their comment upon an earlier draft of this paper.

**Figure 1 - The complex relation between education, labour market, and work**




Workers may be under-utilized or over-utilized. These kind of problems on the shop floor may be caused by the quality of former vocational education. As far as school-leavers are concerned, this seems evident. Older workers may also experience matching problems in the work situation because what they did learn at school is becoming obsolete.Our assumption is that the financial and economic benefits of education are higher as the matches on the labour market and in the work situation are better. Given the level of investments, the rate of return is expected to be higher. So, the functioning of the labour market, the choice of courses taken by young people, and the quality of vocational education and training all influence the returns of education. In this paper, we concentrate on the effects of different choices of courses and of training on the returns of education.

**Choice Of Courses**

Broadly speaking, two developments can be observed in the labour market. The first one is the rising of the average qualitative level of the employment structure; the second is a shift of employment from manufacturing towards the service-sector of industry. These seem to be structural changes in the economies of Western European countries, and presumably, of the USA as well. In the long run, these changes will lead to a shortage of employment for the unskilled and lower skilled work force. At short notice, the labour market perspective of these people may be better because of a high rate of replacement demand, due to older workers retiring from work.

Decisions made by young people with respect to their education are not always corresponding with developments on the labour market. In the Netherlands, each year about 15% of the school-leavers entering the labour market have no diplomas or certificates at all, and 45% have not completed vocational education. Besides that, unemployment is relatively high among students from the university, especially among graduates in social and cultural sciences and arts. From a labour market point of view, these students, apparently, have made the wrong choices.

Choosing a discipline or a vocation is a far reaching process which starts in the last year of basic schooling and ends when leaving the educational system. As a result, school careers are generated. The Netherlands Economic Institute, commissioned by OSA, has computed the rate of return of a large number of school careers (educational routes) (Gelderblom e.a. 1994, Odink en Kunnen 1995). The rates of individual return turned out to vary from -4% to +8%, the rates of social return varied from -4% to +6%. Departing from the same starting point, the rates of individual and social returns of the economic/administrative routes are usually higher than those of other disciplines. This applies to all

routes ending at higher vocational levels. For the route via lower and secondary vocational education, the caring discipline produces higher returns than the economic/administrative discipline, while for the route from junior general to secondary vocational education, the returns of these two disciplines are equal. The technical disciplines usually produce the second best rate of return, while the returns of the caring discipline are usually the lowest.For most disciplines, the rates of return are higher for men than for women.

With regard to the practical relevance of our research line, an important question is whether knowledge about the rates of return of educational routes should be applied in the process of choosing a discipline or an occupation. Computations of educational returns are based on historical data, while relevant information for young people who have to make their choice of courses, concerns the future labour market. A comparison of the computed rates of returns and short and medium term labour market forecasts reveals a reasonable resemblance, however.

In general, the rate of return of education is relatively low in the Netherlands, as computations by the Netherlands Economic Institute did show (OSA 1994, Gelderblom e.a. 1994a). One interpretation is that the Netherlands are investing too much money in education. However, the average Dutch level of education is not higher than in most other Western countries. Government expenditures on education are not, either, and show a tendency to decline. Another explanation may be the malfunctioning of the labour market, which might be the reason that volume signals (shortages and surplusses) do not adequately influence the choice of courses during school time.

Wim Groot and Eddie Mekkelholt of Leyden University, also by order of OSA, have analysed the choice between technical and non-technical education in four Western countries: the Netherlands, Germany, the United Kingdom and the United States (Groot and Mekkelholt 1995).
Table 1 shows the results.

**Table 1 - Effects of choices of courses in 4 countries, 1992**

| | expected earning effect | expected rate of return |
|---|---|---|
| *Netherlands* | | |
| lower technical | -36% | +1.2% |
| lower non-technical | +62% | + .9% |
| higher technical | +69% | +4.9% |
| higher non-technical | -38% | -3.1% |
| *Germany* | | |
| lower technical | +42% | +33% |
| lower non-technical | +52% | +33% |
| higher technical | +41% | +61% |
| higher non-technical | +58% | +68% |
| *United States* | | |
| lower technical | +81% | +47% |
| lower non-technical | -25% | -26% |
| higher technical | +63% | +47% |
| higher non-technical | +35% | +38% |
| *United Kingdom* | | |
| lower technical | +56% | +28% |
| lower non-technical | +71% | +38% |
| higher technical | -40% | + 8% |
| higher non-technical | +53% | +11% |

Method: switching regression analysis. Data: NL - OSA-labour supply panel 1985-1992; G - Sozial ökonomisch panel 1986; UK - British Household Panel Survey 1991;
USA - National Longitudinal Survey 1981.

The figures in table 1 indicate the expected differences in wages and in rates of return between the field of education chosen and the alternative field. Only two fields of education have been distinguished, namely technical and non-technical education. A positive percentage means that the expected earnings or the expected rate of return are higher for the field of education chosen than for the alternative field. A negative percentage means that the expected earnings or rate of return of the field chosen are lower than those of the alternative field.

The negative earning effect of a lower technical education in the Netherlands means that people with this kind of education would have earned more if they had been educated non-technically. The reason why they have chosen a technical education yet, may be the positive rate of return, indicating positive costs. Apparently these people receive benefits or welfare from the being enrolled in education.

The figures for the Netherlands also show the effect of the wrong choices of university students mentioned above. Working people with higher non-technical education earn less as if they had chosen for higher technical education. Also their expected rate of return is lower, which shows that lower costs do not compensate for their lower earnings. This may be caused by the relatively high unemployment rates of graduates in the social sciences and arts. Table 1 suggests a stronger allocative effect of expected earnings and rate of return on the choice of a course in Germany than in the other countries, this effect being weakest in the Netherlands.

This brings us to the process of choosing courses. What are the motives of students for choosing a particular course of study?Further research revealed that information and considerations about labour market perspectives do not play a very important role in the actual choice of a course or an occupation by young Dutch people. The intrinsic qualities of the occupation prevail. Yet, when young people are asked what they think the most important aspect of their future occupation, many of them answer that this is, besides their interest in that particular occupation, the chance of finding a job with it. This is more often the case among students who have chosen a technical training than among others. So, there seems to be a difference between preferences and actual choice of course.

One explanation for this observation might be, that the expectations young people have with respect to labour market developments are so uncertain, that in their final choice most importance is attached to the intrinsic aspects of the course and of the occupation. In other words, there may be a lack of information.The fairly weak allocative effect of earnings and rate of return may prove to be a serious problem in the near future.

Forecasts of the demand of labour in the short and medium term indicate that there may be shortages of technically educated people at the lowest as well as at the highest level, of teachers and of people who have received junior and senoir training in the caring disciplines. These forecasts are based on the expected economic development. To reinforce the Netherlands' international competitive position, the Dutch government pursues a science and technology stimulating policy. As a result, the demand for employees with higher technical education could prove to rise more sharply than is expected at this point.

Today students' choice of courses seems not to be in line with the future demand of labour, but problems can not be prevented by merely changing the choice of discipline. If more students choose a technical discipline at the lowest level this will have a negative effect on the caring discipline, where shortages are already expected to occur. Likewise, an increase in the number of technical students at the highest level could result in an increased teacher shortage.

A better solution seems to be the transfer of unskilled people to lower vocational education and apprenticeship, both in the caring and technical disciplines. Likewise, better progression routes to secondary and higher technical and vocational education are important.

**Discrepancies And Training In Work**

Knowledge and skills learned at school are utilized in work. Underutilization and overutilization are indications for matching problems on the shop floor. In 1992 33% of the Dutch work force experienced a gap between their qualifications and the work they did. There are several kinds of discrepancies, as table 2 shows.

**Table 2 - Discrepancies between education and work, 1992 (%)**

| | |
|---|---|
| - unsufficient practical experience | 16% |
| - education for a different profession | 38 |
| - education on higher level than job | 29 |
| - education on lower level than job | 11 |
| - education is out of date | 6 |
| | 100% |

(Allaart e.a. 1993)

These discrepancies have a negative effect on job satisfaction as well as on earned wages (Mekkelholt e.a. 1991). So we can assume that the rate of return of education is negatively influenced by the existence of a gap between the skills of the workers and the qualifications required to do the job.

There are 3 causes for this kind of gap:

a. matching problems on the labour market have been transposed to the shop floor;
b. workers' qualifications are becoming obsolete;
c. job content has changed.

Most of the discrepancies mentioned in table 2 are probably transposed from the external or the internal labour market. Essentially for employers this is a selection problem. A solution may be found in the replacement of employees by others, but introductory courses may also be helpful.
Out-of-date education, obsolete workers' qualifications and changing job content are related phenomena. They indicate the importance of maintenance and innovation of vocational qualifications.

Especially the rapid growing technological developments of products, services and production processes have made it necessary for working people to keep their vocational qualifications at an appropriate level by means of regular extra training. In the period september 1986 - september 1988 41% of the employees in training companies had participated in one or more training courses. In the period september 1990 - september 1992 this figure was 45%. The participation rate of employees, who worked in companies that did not provide training courses for their workers and who therefore had to take courses in training institutions themselves, declined between these two periods from 33 to 26% (OSA labour supply panel). These figures underline the importance of training policy by companies for the quality of the labour force.

It is necessary from business perspective as well - in this case an increase in productivity - to provide further training to employees. Consequently, the quantity of internal and external company training courses has increased considerably between 1986 and 1990. In 1986 405,600 internal and 301,000 external training courses have been taken. In 1990 these were 728,500 internal courses (+80%) and 390,000 external courses (+30%) (CBS 1992).

The effect of company training courses on the productivity of the company seems strong. Gelderblom e.a. (1994b) used data from the OSA labour demand panel to estimate the effect of company training on productivity and wages. This database consists of more than 2,000 manufacturing, service and state organizations, questioned every two year. The researchers estimated that in 1989 and 1991 a 1% increase of the number of employees taking courses has resulted in an increase of productivity of approximately 1%. The effect of external courses was stronger than the effect of internal courses. Company training proved to be of little influence on the amount of wages the employer had to pay. The wage sum was strongly effected by the
composition of the company's labour force: there is a positive relationship between the average level of education of the employees and the total wage bill.

These effects on productivity and wages may explain the increasing training efforts of companies during the last, say, ten years. The rate of return may even be higher because there are clear indications that after a period of expansion companies are going to test their training policies for efficiency and effectiveness, in the sense that they are looking for courses that are better geared to the company's

requirements. As mentioned above, the number of courses taken between 1986 and 1992 increased, but the average costs per course have decreased. The number of internal courses has increased in comparison with external courses, but fifty percent of the internal courses are set up with help from outside. Trade organizations now provide a smaller part of the company training courses than in 1986 but the role of commercial, private training institutes has become more important.

Many researchers have shown that for individual workers taking company courses is very profitable. According to Mincer (1991) one company course results in a wage growth varying between 4.4 and 10.8%. For the Netherlands Groot, Hartog and Oosterbeek (1993) found a wage effect of 21.2% for every year courses were taken. Groot (1993) concludes the effect being even 32.2%. Gelderblom e.a. (1994a), using OSA la bour supply data, found an increase of the net hourly wage of 2.8% per company course taken.

Looking at these results it seems clear that taking company courses is a very profitable investment. High rates of return usually are indications for underinvestment.
There may be many reasons for underinvestment in training, one being the reluctance of workers to participate. Kunnen and De Voogd-Hamelink (1995) have tried to explain workers' participation in training by analyzing data of the OSA labour supply panel. First, data of representative samples of the Dutch labour force have been analyzed (cross-section analyses). Two kind of training courses were distinguished: company courses and other, non-company courses.

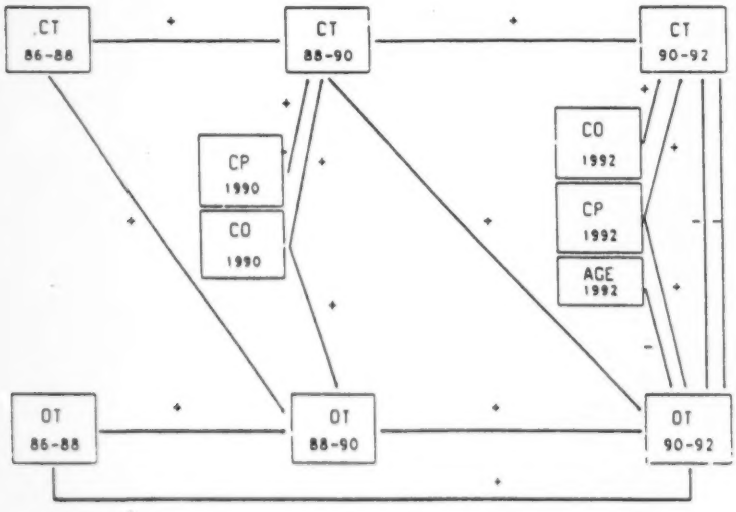
**Table 3 - Logitanalysis of participation of workers in training courses (1992)**

| | company training | non-company training |
|---|---|---|
| sex=female | -0.48** | -0.01 |
| age | -0.05** | -0.05** |
| education=low level | 0.03 | -0,19 |
| civil status=single | 0.24 | 0.13 |
| occupation | | |
| - high white collar | 0.12 | 0.06 |
| - low white colar=reference | | |
| - blue collar | -0.19 | -0.25 |
| company training courses taken before | -0.23** | 0.02 |
| other training courses taken before | -0.17 | 0.31** |
| company size | | |
| -size=1 | 0.52* | -0.07 |
| -size=2 = reference | | |
| -size=3 | -0.18 | 0.07 |
| -size=4 | -0.16 | -0.05 |
| company finances courses | 1,64** | 0.18 |
| industrial sector | | |
| -manufacturing = reference | | |
| -services | -0.06 | 0.25 |
| -state and public administration | 0.43* | 0.08 |
| appointment | | |
| - fixed | -0.02 | -0.19 |
| - temporarily = reference | | |
| number of work hours per week | -0,00 | 0.01 |
| number of months appointed | -0,02 | -0.01 |

** = $p<0.05$ * = $0.10<p<0.05$

Female workers have a smaller chance to take company courses than male workers. It should be noted, however, that in 1988 and 1990 this was not the case. The negative effect of age is in accordance with the human capital theory. Low educated employees do participate as much as in company training as high educated employees. In 1988 and 1992 they participated less in other courses, but this difference disappeared in 1992.The probability of taking company courses is smaller for workers who have taken courses in the previous two years. In the case of other courses the opposite is true: previous participation increases the probability of participation.

**Figure 2 - Panel analysis of participation in training employees, 1986-1992**




*CT = employee taking company-based course(s)*
*OT = employee taking non-company-based course(s)*
*CP = company pays training courses*
*CO = company organizes training courses*
*AGE = age of employee*

Analysis of data of a fixed sample of workers in several years (panel analysis) shows that people who have taken courses before will continue to do so in future (figure 2). Employees who have taken company training courses subsequently often take other vocationally oriented courses. Whether or not employees will participate in company training courses, depends, among other things, on the company's training policy. Personal characteristics seem to be less important. Wong and Siegerist (1989) showed that employees are more inclined to take company courses when they feel that by doing so they contribute to the commercial succes of the company and when the effects of their training efforts are made perceptible to them. Furthermore it is of importance that employees having taken training courses receive a part of the benefits of company training.

Companies that pursue active training policies, follow a selective employment policy. Women and poorly educated people have less chance of being employed, because the rate of return of their company training is expected to be relatively low. This may be a self fulfilling prophecy, of course. It may have as a consequence, however, that these categories do not sufficiently maintain and renew their qualifications, which means that for them the value of this capital asset will decrease. Investigations have shown that this could also involve a rise in social inequality.

In view of the foregoing, it seems important that sufficient facilities are available to maintain and renew qualifications of the work force. On the one hand, this is a task for the business community, since an adequately trained staff is indispensable for a company's development and continuity and a precondition for company-related training. On the other hand, occupation-oriented training cannot entirely be left to the companies themselves.

**Discussion**

In the paragraph *Choice of courses* we have concluded that the rate of return of school-based education in The Netherlands is relatively low. In the public discussion two explanations are often mentioned:

a. Overinvestment in education by the government;
b. Malfunctioning of the labour market, so that volume signals from the labour market are insufficiently guiding the choice of courses by young people.

According to our picture of the complex relationship between education, training, work and the labour market, the rate of return of education is affected by the match between workers' qualifications and the qualifications required on the shop floor. There may be a mismatch because a mismatch on the labour market has been transposed to the shop floor. Another reason may be that the workers' qualifications do no longer fit the requirements of the job, because they are not adequately maintained and renewed. So, a lack of training in working life may be a cause of low economic returns of education. If this is true, as we believe it is, there are good reasons to reconsider the relationship between school-based education and company-based training. Especially, a reallocation of investments from the former to the latter, both by the government and the individual, is worth considering.

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